ON

GENERAL PRINCIPLES IN MEDICINE;

AN

Introductory Address,

DELIVERED AT

ST. GEORGE'S HOSPITAL

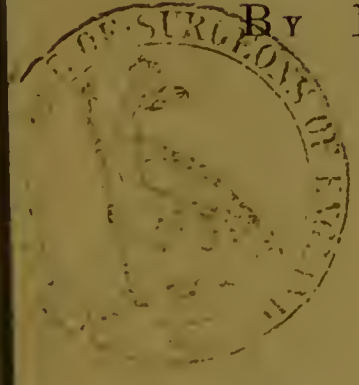
AT THE

OPENING OF THE MEDICAL SESSION,

October, 1863,

By HENRY LEE,

SURGEON TO THE HOSPITAL.



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PREFACE.

THE Governors of the Weekly Board of St. George's Hospital having done me the honour to request that I would publish the following address, I feel it due to myself to state that it was written entirely for the benefit of students; and that it is now published as it was delivered to them, without alteration, and with the addition only of a note containing an extract from the autobiography of the late Sir Benjamin Brodie.

9, Savile Row,
Oct., 1863.

ON

GENERAL PRINCIPLES IN MEDICINE.

ARRIVED, it may be, for the first time in this great metropolis, some of you, gentlemen, are about to enter upon the study of the profession of your choice, and to begin in earnest the real business of your lives; and it is right that you should be welcomed at the outset with some words of encouragement and advice, for, if I may rightly interpret your feelings, by what I recollect of my own, under similar circumstances, you may ere long require every assistance that can be afforded you in this way.

One of the first impressions that a student receives, on his arrival in this city, with its teeming population, is that every one, except himself, appears to have some fixed and definite occupation in the pursuit of which he is busily engaged. Hence, a feeling of isolation creeps over his mind as he sees, on every side, men intent upon interesting and absorbing engagements, in which, as yet, he can take no part; but he believes that, as soon as he can commence his studies, this feeling of loneliness will be

relieved. He believes that in the hospital he will see and at once be able to recognise many different diseases, and that for each one of these there is an appropriate remedy, which, if he cannot himself apply, he will at least have the satisfaction of seeing applied by others. He goes, perhaps, into a ward, but the same feeling of isolation follows him. He cannot recognise the diseases which he expected there to find, and he is disappointed at not being able to trace the actions of medicine.

He is told that his education must not begin here, but in dissection, and in the lecture-room ; accordingly, with a full purpose of obtaining an insight into the, as yet, hidden mysteries of the profession, he goes to the Anatomical School.

Here he hears a strange language—a language far too fluently spoken to be readily understood.* He will hear of eight bones in the head, of fourteen in the face, of twenty-four in the spine, of twenty-six in the chest, of four in the hips, of sixty-four in the upper extremities, and of sixty in the lower.

Each of these the student will be told has its processes, its surfaces, its extremities ; each with its different aspects to furnish attachments to different tendons. These bones have to be clothed with muscles of a great variety of forms, and with many different uses. The muscles have in their turn to be supplied with blood-vessels, nerves, and absorbents. With all of which the student is expected to become acquainted.

* Paget.

The large cavities in the body are fitted with parts, also with their full complement of blood-vessels, nerves, and absorbents, each one of which affords a separate study. In the description of these organs the student will hear terms used, many of which are so irrational and arbitrary, that they cannot without a circuitous mental process be remembered as being associated with the things which they are intended to represent.*

He will, perhaps, hear of a sella turcica; of the clinoid, or coranoid, or coracoid processes.

He will be told of the vomer, the malleus, and the incus, and will in vain endeavour to associate the uses of these parts with their names, or he may perchance hear an aqueduct described which, to his astonishment, he will learn is for the purpose of transmitting a nerve.

Many days will thus pass before his ear becomes at all accustomed to the language in which he is to follow his studies, and he will conclude that those who originally framed the terms of the sciences which he has to learn, have certainly not regarded the difficulties of those who were to follow, and have handed down to their successors a set of vicious symbols, which prove most unnecessary stumbling-blocks in the way of beginners.

But anatomy is one branch only of what the student will be called upon to learn. There remain comparative and morbid anatomy, physiology and

* Compare Dr. Salter's Introductory Address.

pathology; chemistry, general and pharmaceutical, and materia medica; surgery, theoretical, clinical, operative, and ophthalmic; medicine, theoretical, clinical, obstetrical, and forensical;* with the use of the ophthalmoscope, the stethoscope, and the laryngoscope. In general science he will be expected to learn something of mathematics, and metaphysics, mechanics and optics; of hydraulics and pneumatics; of mineralogy, botany, zoology, and geology. In literature, besides Latin and Greek, he will be told that he should know at least French, Italian, and German.

A thoughtful and earnest student (a friend of my own), when he heard his first introductory lecture, and when there arose before his mind the mass of work to be done, the short time to do it in, the multiplicity of the subjects—each with its special difficulties, the struggles of competitors, the vast stake at issue in the alternative of success or failure, and the hopes of friends in the country, felt, as he has expressed it, "overwhelmed." A feeling of blank despair hovered over his mind, and he experienced a terrible sense of mental paralysis—a kind of waking night-mare, which drove him to exclaim, "There is no hope, it cannot be done."

Having myself experienced something of this feeling, I am here, gentlemen, to re-assure you upon the point, and to show you that what is required, as far as medical education is concerned, may not only

* Dr. Latham.

be easily, but pleasantly performed; and those among you who already know these things, will, I am sure, bear with me while I endeavour, by means of some very simple illustrations, and by some of a more complicated character, to make my meaning plain to those who are now here for the first time.

If you sit down and try to learn all the facts of any one of the sciences which I have enumerated separately, you will indeed have a difficult task. If, for instance, in the science of botany, with its fifty thousand known species of plants, you attempt to store up in your minds all the different isolated facts which may be presented to you, the period of your education will be gone before you have fairly commenced your labour. Or if, again, in anatomy, you learn by heart, as it is termed, the answers to the ordinary questions that are asked, you may indeed become sufficiently expert even to pass an examination; but if you should have the misfortune to learn only in this way, and after the lapse of even a few weeks from the period of your examination will reflect upon what you really know, you will find it to amount to very little indeed.

A fellow student of my own at one time, I believe, could repeat by heart almost any portion of a book with which you will perhaps soon be better acquainted, namely the "Dublin Dissector." Yet I doubt whether he ever had any real insight into the functions and uses of any part of the living body; at all events he has not as yet made any practical use of his knowledge.

I wish to advise you to begin and to continue

your studies in an entirely different way. I wish you to see in the simplest daily observation which you may make, the illustration of some principle which will connect it in your minds as by a common link with all other circumstances of a like nature. As soon as in the physical sciences you learn in this way one such fact, you at the same time learn something about a vast number of other things, which all come under the same law. Thus, if you could by any means ascertain the composition of the common salt which we daily use, you might from the single fact thus ascertained, know, exactly and precisely, how these same ingredients would enter into chemical combinations with other substances. The knowledge which you would have obtained, instead of being an isolated truth, would be the illustration of a principle or a law which would apply, under certain modifications, to all other chemical combinations of the same ingredients.

This idea, once received into the mind and realised, leads to the general inference that when chemical elements are brought together, they do not form mere mixtures, but that they unite in exact definite proportions, the bulk and weight of which is predetermined with the greatest accuracy.

There may probably be many different chemical elements, which have never been brought together so as to form chemical compounds, yet no chemist can doubt that it is already fixed and predetermined in what proportions they would unite if brought together under favourable circumstances.

Or again, if any of you were to watch attentively, and day by day, the changes which take place in a common egg exposed to the same temperature as that to which it would naturally be subjected, you would have learnt something about the development of every kind of bird in existence, and you would know further something about the original mode of formation of every kind of animal.

The same general principles, the same recognition of general laws, will assist us in our studies of the vegetable world. Here, as in the other branches of knowledge, instead of learning separately and in detail every individual fact, the laws or principles may be grasped which regulate the growth, the development, the decay of each different kind. A kernel is planted in the ground, and by means of the vital power within it, a peach tree is in time produced. Another kernel is planted, and a nectarine tree by a similar power is developed. From the almost invariable way in which these results follow, we are apt to think of them as the indications of separate forces inherent in the different seeds. But by-and-by a case will occur in which the fruit produced will present on one side the characters of a nectarine, and on the other those of a peach. This exception to the general rule will at once enable us to see that it is the same power modified by some particular circumstance, which produces both the nectarine and the peach. This power does not reside exclusively in any tree or set of trees, although it brings them under its influence and control, and

would probably have existed in nature, even if no peach or nectarine trees had hitherto been formed.

Allow me to give you another and a somewhat more complicated illustration of the way in which these general laws, powers, or principles pervade every part of the visible world as exposed to our investigation and interpretation.

It is an observation commonly enough made, that the human body may be called a microcosm,* as if it did not so much differ from the universal system of nature so much in the symmetry and number of its parts, as in its size. In this lesser world the powers that move the limbs had been investigated year after year, and were thought to be sufficiently explained, when nerves were traced from the spinal cord to the different voluntary muscles.

The moving power was here recognised, and the law established that whenever a nerve was affected, either by mechanical irritation, or by an impulse of the will, the muscles to which it is distributed were immediately thrown into action. But it was subsequently found that something more than this was necessary, in order that the muscles should perform their proper functions; for cases occurred in which patients lost sensation of a great part of the body, and it was then perceived that the muscles acted, indeed, but irregularly, and without any combined motions. For this, among other reasons, it became evident that the muscles must not only be endued

* Bacon.

with the power of acting, but be regulated in those actions, and hence arose the idea that in every voluntary muscle there must be nerves of sensation, as well as nerves of motion.

A great principle was here developed, and experimentally demonstrated by our own countryman, Sir Charles Bell, and other physiologists since his time. The muscular sense was recognised, and added to the other senses, which were previously known. By it we are conscious of the amount of effort made in endeavouring to raise a weight, although we may not move it. This sense it is which gives us the knowledge of the exact amount of power required in different muscles, in order that they may concur in producing the various motions of the body. If this sense be impaired, or cease to act in conjunction with the will, the muscles act irregularly, imperfectly, or not at all. The governing power is gone, and, as in a community, so in an individual system, the different members have no combined action—no co-operation.

But even after so much had been done by Bell, Magendie, and Mayo, in the earlier part of the present century, the idea, the law, the principle, was not seized in its fullness.

It soon became evident to reflecting minds, that this sense, supposed to reside in the different muscles, was not sufficient to account for the regulation and adaptation of some of the most beautifully contrived motions in the body. The muscles of the eye, for instance, have not, or possess in a very imperfect degree, a muscular sense in conjunction with the will,

and they are therefore, in some respects, analogous in their physiological relations to the so-called involuntary muscles of the body. When the eyes are closed we know not in what direction they look, unless we feel the prominent cornea beneath the lids. We should in vain require a blind man to fix his eyes on any object, and the reason why he cannot do so is evidently that the sense which governs the muscles of the eye is absent. The peculiar offices of the muscles of the eye, in directing it and adapting it to vision, require that its actions should be regulated not by that sense which controls ordinary voluntary motions, but by the sense of sight.

A local plan of governing the movements of the eye is adopted, which does not depend upon, and is in very imperfect communication with, the general sensorium. But these facts admitted, and after all the brilliant labours of Bell, of Magendie, and of Mayo, the mechanism for the regulation of muscular action was known, in as far as it related to the *voluntary muscles only* — those muscles I mean which act in concert with the will, and are guided and controlled by sensations and feelings of which we are conscious. Still there remain in this little world of ours a vast number of actions, of which the central governing power takes no cognizance. Many functions are performed quite independent of our wills, or even of our consciousness. Many secretions have to be elaborated in the various parts of the body, and have to be transmitted to their appropriate destination. The blood has to be propelled in a con-

tinuous circle throughout the frame ; and how completely the combination of forces, which for seventy or eighty years in succession can produce the desired effect with unerring certainty : — how completely that is independent of our ordinary sensations is proved by the great fact, that this wonderful circulation had gone on in every human being from the commencement of the world without ever being even suspected until it was demonstrated by our immortal countryman, Harvey.

As the fact of the circulation of the blood was unknown, it is no wonder that the mechanism, by means of which that circulation was controlled and regulated, was never investigated. Indeed in our time it has been publicly taught that all the thousand different muscular fibres in the heart, that great central organ of the circulation, could act in concord without those actions being regulated by nervous influence. It was a favourite experiment of some physiologists of our own day to demonstrate the heart of one of the lower animals beating when removed from the body, and, consequently, when cut off (as the term was) from any supply of nervous power. But you may even at this early period of your studies, take it for granted, that nothing happens in the human body without its appropriate cause. The different parts of the heart would no more beat in harmony, now quicker now slower, a sure index to the physician of the patient's state of health, independent of nervous influence,—the heart could no more thus beat without a cause than a stone

would fall to the ground of its own accord. The cause in both these instances long remained hidden from our view, in the one case in the centre of the earth, in the other in the substance of the organ, and in both they have now been revealed to us by the labours of philosophers and physiologists.

Again, there are other actions in the human body that occur on certain occasions only. Such are the acts of sneezing, coughing, the peristaltic motions of the intestines, vomiting, and other reflex actions. Now all these operations take place independently of our will. They are reflex actions, not under the control of the central nervous system. But it does not follow that they are not as accurately directed as any of the voluntary motions of the body. The nervous centres which receive the necessary local impressions for the regulation of these functions are connected by very slender ties with the brain and spinal cord. They exercise an independent administration, and regulate the affairs of their own department, even when the nervous centres connected with sensation and volition repose in sleep or are palsied by disease.

That the involuntary muscles are as freely supplied by nerves, as the voluntary muscles of the body,—nerves connected with their own centres,—their own ganglia, by means of which the various reflex impressions are so regulated that they may be conveyed from any one point to an entire organ, is fully demonstrated by the series of dissections now before us.

These preparations show the nervous system in some of the lower forms of living animals. This system is seen in them to consist of a simple ganglion with radiating fibres, unconnected with even the semblance of a spinal cord. Some of these drawings represent similar ganglia connected with the nerves of internal parts in a human being. These demonstrate the hitherto concealed nerves of the heart with their ganglia, which may be described as so many telegraphic stations, to insure instantaneous communication between every part.

Here again are displayed the nerves of the stomach and intestines.

The series of preparations on the table demonstrate the same great truth as uttered by nature; namely, that every muscle in the body is supplied with nerves which regulate and control its actions.

I need make no apology for introducing these preparations to your notice in an introductory lecture, inasmuch as this is the only hospital in London —may I say, the only medical school in the world— where such a series of preparations may be seen; and this is certainly the only school where the author of those dissections can himself demonstrate his labours.

Judging from the reception that similar discoveries has had in past times, it is not unlikely that it will be said that the existence of these nervous centres, these ganglia, with their radiating nerves, was previously known. But a learned society, by one of those singular acts of retributive justice, which not unfrequently produce effects directly op-

posed to those which were intended, has for ever set its seal, marked with a deeper impress than could be stamped on any medal, to Dr. Lee's claim, by having at the period when the dissections were first shown, formally adopted the opinion that the parts dissected in these preparations were not nerves at all! Dr. Lee's claim to the discovery of these nerves is again fully established by the fact that in Mr. Swan's most elaborate and beautiful plates, published a few years ago, although the nerves and ganglia of the sympathetic are admirably shown, as they may be traced in the loose cellular tissue of the chest, yet are there no indications of any ganglia,—any nervous centres,—such as are shown in these preparations, in the substance of the heart itself.

But to return from this somewhat lengthy digression. The point which I wish to impress upon your minds is that, if you will attentively consider even one of these preparations—if you will observe how the nerves run to and from their local centres (their ganglia)—you will be in a position, without any difficulty, to understand the mode in which *all* the involuntary muscles of the body are supplied. You will then no longer think with those who would have you believe that the heart acts independently of nervous influence, and you will at once see by what kind of mechanism it is that a disease (in perhaps a distant part of the body) may be recognised by the physician before the patient himself is conscious that he is ill.

Upon one occasion I called at the house of a

gentleman advanced in years, whom I had long known as a patient, and found him dressed, as usual, and down stairs. He had, indeed, forsaken his usual easy couch, and was sitting on a common chair at the table. He wished to go into the country, as the change, he thought, would do him good; but he complained of no inconvenience of any kind. To my surprise I found the pulse beating upwards of 120 in a minute. My patient reluctantly consented to go to bed, and in less than forty-eight hours the heart, which had sounded the alarm without any of the ordinary sensations being disturbed, had ceased to beat!

A general review of the facts now stated develops the general principle that *all* the muscles in the body are supplied with nerves of motion, and all are supplied with nerves of sensation. The only difference being that some of those nerves are in close connexion with the spinal cord, are subject to the mandates of the will, and are regulated by sensations of which we are cognizant; while others, which have centres of their own, do not depend upon the spinal cord for the due performance of their functions, and the influences which they transmit are not appreciated by our senses. The so-called voluntary muscles are supplied by the first class of nerves, the so-called involuntary muscles by the second; and the muscles of the eye afford the example of an intermediate group acting in many respects quite independently of the will, and yet regulated by a sense of which we are conscious.

One other illustration only, of a more practical character:—

There is a class of affections in which one part of the blood becomes separated from the rest, and converted into a material more or less solid, even while still within the vessels of the living body. The solid material thus separated has been called fibrin, and after it has ceased to be a part of the circulating blood it is liable to undergo various other changes, which result in its becoming *liquefied* and disintegrated. It is then in a condition in which it may again mix with the circulating blood, and may be carried to any part of the body. But inasmuch as the blood-vessels, as they proceed from the heart, are constantly divided into tubes of smaller dimensions, if the process of liquefaction has not been completely carried out, the particles of altered fibrin at length meet with tubes of so small a diameter that they are unable to pass. They then become impacted in the vessels, and sometimes masses of very considerable size are thus accumulated.

In the process of liquefaction, which I have mentioned, the fibrin may undergo a greater or less amount of decomposition, very much in the same way as it would if allowed to remain at a high temperature out of the body. This decomposed or decomposing fibrin I know by experiment acts as a powerful poison when introduced into the circulation. It will kill an animal with great certainty.

Now Dr. Polli, of Milan, has recently published a very interesting series of experiments, by which he

shows that the use of sulphurous acid in combination with potash or soda possesses in an eminent degree the power of arresting organic fermentations, and putrefactive changes in animal solids and fluids. He found that these preparations, which are called the sulphites (the sulphite of soda, of potash, or of lime),—that these sulphites were perfectly harmless when taken into the stomach, and the idea occurred to him that these same preparations, which exercised such a powerful influence in preventing decomposition out of the body, might also prevent similar actions in living animals.

Dr. Polli gives us the details of sixty-eight experiments, which appear to have been most carefully made. Several dogs had some putrid blood injected into their veins, and being subsequently left to themselves they all died, with one exception: an equal number of dogs had some large and repeated doses of the sulphites administered, and subsequently had the same quantity of putrid blood injected. These all recovered. More than this: Dr. Polli found that if he mixed the putrid blood with a certain proportion of bisulphite of soda before he injected it that the dogs did not die, as when the putrid matter alone was used.

Should Dr. Polli's experiments be confirmed by subsequent observation, and should his anticipations be realised, we shall have in these preparations containing sulphurous acid a means of counteracting in a great measure, not the affections which arise from decomposition of the fibrin of the blood only,

but of effectually treating a very large class of diseases, which have hitherto defied the utmost efforts of the physician. Dr. Polli mentions among the zymotic diseases, which he supposes to depend upon a fermenting principle in the blood, cholera, typhus, puerperal fever, glanders, black vomit, dissecting wounds, marsh fevers, &c. And if his conclusions be confimed these diseases would now be capable of prevention in a number of instances, and in others they would be no longer fatal. They would be as amenable to treatment as other disorders. An army might be rendered safe from the devastation of typhus, and a military hospital from the scourge of gangrene.

I would then have you study carefully any one case of blood-poisoning, which may present itself, and consider the means which may be used either to prevent or to remedy such a disease; and you will know something of a large class of similar affections, and of their mode of treatment. The illustrations which I have ventured to offer will prepare you to believe, that all the actions in living animals are governed by laws, as definite and regular, as those which regulate the visible world, and that to apprehend these laws when divested of the technical language, in which they are often clothed, is neither difficult in itself nor devoid of interest.

To the study of medicine pursued in the way which I have endeavoured to indicate, may with much truth be applied the words of Sir John Herschel. "In it," he says, "there is no object unimportant or trivial. From the least of Nature's

works the student may learn the greatest lessons. The habit of tracing the law—the general law—upon which even the minutest action depends, is one of the greatest delights which the study of science imparts. A mind that has once imbibed a taste for scientific inquiry, and has learnt the habit of applying readily its principles to the cases which occur, has within itself an inexhaustible source of pure and exciting contemplations. Accustomed to trace the operations of general causes, and the exemplification of general laws in circumstances where the uninformed and uninquiring eye sees neither novelty nor beauty, he walks in the midst of wonders. Every object which falls in his way elucidates some principle, affords some instruction, and impresses him with a sense of harmony and order. Nor is it a mere passive pleasure which is thus communicated—a thousand questions are continually arising in his mind—a thousand objects of inquiry presenting themselves, which keep his faculties in constant exercise, and his thoughts perpetually on the wing, so that lassitude is excluded from his feelings, and that craving after artificial excitement and dissipation of mind, which leads so many into frivolous, unworthy, and destructive pursuits, is altogether eradicated from his life. There is something in the contemplation of such general laws, which tends powerfully to tranquillise and reassure the mind, and to render it less accessible to repining, selfish, and turbulent emotions."

In endeavouring, however, to impress upon you

the necessity of associating the different facts which come before you in the study of your profession with the general principles, powers, or laws by which they are regulated ; let me not for a moment be understood to mean that you should be content with a general knowledge of any subject. On the contrary, I would have you, especially at the outset of your career, study each fact, at whatever cost of time and labour, with the greatest possible accuracy, inasmuch as the accuracy of the general principles, which are to last you through life, will depend upon the accuracy of the observations upon which those principles are founded. And in order that you may be sure that you have laid a sound foundation upon which to build your conclusions, I would have you see and touch, and hear for yourselves, and never be satisfied with the description at second hand, when you can use your own senses.

I would have you not only see, but would have you obtain an insight of your subject. For centuries men had seen for themselves, that when an arm was bound up by a tape, that the veins were swollen ; but the first man who obtained an insight into the meaning of that fact—the first who *correctly perceived* what he saw, was William Harvey. "If we content ourselves," says Harvey, "with the observations of others, the sprightly edge of our own wit will languish, and we extinguish the lamp which they lighted to our hands. It is those who follow nature's conduct with their own eyes (sometimes through a perplexed yet faithful tract) who attain the highest

pitch of truth." "Let us blush," he observes, "in this so ample and wonderful field of nature, where performance still exceeds what is promised, to credit other men's traditions only. Nature herself must be our adviser. The path she chalks must be our walk. While we confer with our own eyes, and take our rise from meaner things to higher, we shall at length be received into her *closet* secrets. For nature being divine and perfect is always consonant to herself."

If we accurately and faithfully, therefore, note any one of her multiform operations, we may be sure that we have correct illustrations by example, of some of her general laws.

Nor is the mode of learning, which I am now advocating, of modern origin, however much it may have been neglected in past times, and however little it may be esteemed by some in the present day. It has the highest sanction. The delicate pencillings on the leaves of a wild flower, the winter store-house of the ant, and the wonderful provision in varied climes, and under every diversity of temperature, for the clothing and sustenance of all the different kinds of birds, have been for centuries so many "illustrations by example" of principles higher in their order, and more general in their application, than any that it was the peculiar business of Galen or of Harvey to teach.

It becomes then a question of the first importance in medical education to ascertain how this insight into nature's operations—this power of rightly inter-

preting her laws may be acquired. And very various are the modes, which, at different times, have been recommended.

There have not been wanting those who have maintained, even in our own day, that the first principles of medicine, as of other branches of philosophy, must be developed in the mind by the pure light of reason, undistracted by sensible impressions, and operating on the objects of its own consciousness alone.*

It is maintained that man has the faculty by the *lux intellectus*, the *lumen siccum*, the pure reason, within him, of obtaining the power of interpretation, and of gaining an insight into nature's laws. And as a remarkable instance of this faculty, it has been stated that Dalton was enabled at once, and without passing through the subordinate stages of painful inductive ascent, to announce in its most general terms the law of definite proportions in chemistry, to which I have already alluded. But in these higher considerations, as in the study of simplest particulars, accuracy is all important. Now, I had the privilege and the happiness of knowing Mr. Dalton personally, and of being for some time his pupil, and I know that he attributed his success chiefly, not to any particular innate genius, but to a sound mathematical education.

Again, there have been others who have maintained that a thorough acquaintance with classical

* Compare Hunterian Orations, by Green and Babington.

literature is the best preparation for the student's mind. And we have no need to go further than our own hospital for brilliant examples of those in whom the highest classical attainments have co-existed with the deepest insight into nature's secrets. One,* who now no longer adorns the profession of medicine, was wont to say that as it is the first impulse of instinct to acquire our native tongue, it is no less the first impulse of reason to extend the use of the same faculty to acquire the languages of the dead: to possess ourselves, as he said, of the keys of the tomb, in which antiquity is embalmed. To have access to these grander and more lasting than Egyptian monuments, in which not the shrunken form and lineaments of nations are preserved, but their wisdom and their wit, their inspiration and their genius, still breathe in "thoughts that speak and words that burn."

But if we have those who attributed their success in life to mathematical or classical culture, we have, on the other hand, men not less distinguished, who have without such advantages gained as deep an insight into the various chemical, mechanical, and vital forces which govern this lower world. We may have heard a Faraday congratulate himself that his attention had not been distracted from the contemplation of nature by any of the usual processes of education, and we may have noted that the greatest medical discovery ever made was not among the busy haunts of men, but in a country village. Unaided and alone, Jenner

* Mayo.

observed the beneficial effects of vaccination as revealed by the silent and hitherto secret operations of nature.

If we then find men with such different modes of education obtaining the same power of insight into what Harvey calls the closet secrets of nature, must we not conclude that it is with the mind as with the body, viz.: that real strength and energy do not depend so much upon the kind of food presented to us, or upon the manner in which it is prepared, as upon our power of digesting, assimilating, and making it our own.

But in dwelling upon the mode of acquiring medical knowledge, I must not forget that I am addressing those who in a very few short years will have to apply that knowledge to practical purposes, and therefore it is very important that the kind of knowledge which we acquire should be such as will pass current as something worth among our fellow men.

A master of our art has said, that in laying down any scheme of education, we must take care to make it suitable to the majority of those who are to be educated. Very few enter our profession who are not to live by it; comparatively few who are not required to exercise its practical duties early. "With all becoming deference," says Dr. Latham, "to those who so loudly trumpet forth the praises of knowledge, and fright the trembling student with a portentious array of the wonderful things he has to learn, I would venture to crave some little regard for what is not

so much as named by them, but what is pre-eminently more important than knowledge itself. I mean wisdom, as a thing distinct from knowledge, but not opposed to it; requiring, indeed, knowledge to work upon, but taking care to proportion that knowledge to the real end which itself (wisdom) has in view. I marvel that this wisdom is not enumerated among the ingredients of the physician's character, since it is conspicuously the chief of all."

The point of the highest consequence in medical education is, therefore, not so much that you should attain the abstract knowledge of the different branches of medical science, as that you should obtain practical wisdom in the use of that knowledge which you may have, remembering the words of a poet of our own :—

> "Knowledge and wisdom, far from being one,
> Have oft times no connection. Knowledge dwells
> In heads replete with thoughts of other men;
> Wisdom in minds attentive to their own.
> Knowledge, a rude unprofitable mass,
> The mere materials with which wisdom builds.
> Till smooth'd, and squared, and fitted to its place
> Does but encumber, whom it seems to enrich.
> Knowledge is proud that he has learnt so much,
> Wisdom is humble that he knows no more."*

An older poet, and a wiser man, has said of true wisdom, "After I am come into my house I will repose myself with her, for her conversation has no bitterness, and to live with her has no sorrow, but joy and peace."

* Cowper.

The study of physiology teaches us that every part of a living being has its own independent vitality, so that a portion of a body, as, for instance, a tooth, may be entirely separated from its connections, and may become united again to another living being, and may there form permanent and intimate relations. Each part has its natural period of development, growth, persistence, and decay. Each is in the natural process of nutrition constantly being renewed. Some material is being taken away, and some fresh matter is being added, but during this process the part remains the same, and retains its individuality. We recognise the same hand or face that we knew twenty years ago, although it may have no particle of its former structure. Each part, formed on the matrix of that which precedes it, partakes of its nature, although it may be endued with very different degrees of vital power.

Now, as in natural, so in political and social constitutions, the aggregate of the different living members constitutes the life of the whole. And a corporate body may remain the same, although its individual constituents are, from time to time, changed. We lived in our ancestors, as they will survive in us. Thus, constituted societies in some sense are without death, and this feeling of our being in some way united to our predecessors, has led many learned societies to devote a day to the commemoration of their deceased benefactors. For it is a part of natural piety to decorate the memories of those to whom we can no longer grant any other recompense.

Among those who have raised this school and hospital to eminence, what heart beats not at the name of Hunter—that great and celebrated name ; a name that will ever keep this school famous in the records of our profession. It may indeed be called

> "Clarum et venerabile nomen
> Gentibus, et multum nostræ quod proderat" arti.

He, above all, was destined to recover the before lost method of Hippocrates, by which, without theory, and out of an individual experience, the forms of knowledge revealed themselves. At the same time he taught us that experiments alone, without an enlightened observation, could not advance knowledge. They might amuse for a time, but then pass off the scene, and leave no trace behind. But with him this observation directed and substantiated the course of every experiment. And yet he observed the forms of external nature as if she had been then for the first time noticed, and attended to ; and he related what he had seen, without mixing *himself* up in it.

Thus, in Hunter, were fulfilled the double and hitherto supposed opposite requirements of the greatest philosophic mind—in every effort of which progression and development are manifest.

I shall not attempt to say more on so illustrious a theme, which has been so often better handled than in this my humble attempt. But I will affirm that in Hunter his art was a sacred thing, not a means to an end, but as the completest test of genius—the end itself. Nor was he ever diverted from prosecuting or

proclaiming knowledge by that golden ball which was once thrown before Atalanta, and has ever since let and hindered the course of those men who have stooped to pick it up.

But alas! we have one nearer to us to lament—worthy, indeed, of his great forerunner—on whose shoulders exalted Brodie seemed even to see further than his great master himself. Identified with us in this present scene, which of us does not mourn his irreparable loss? His monument, like that of Sir Christopher Wren, may be said to be around us. All things speak here of that great spirit which has been withdrawn from us, not prematurely, indeed, but in the ripeness of his assured fame. He is, indeed, worthy of our grateful remembrance, because he did not live for himself; and, in dying, he did not forget the old scene of his labours and triumphs. During the last day that he completed here he held a conversation on medical affairs with the friend and companion of his riper years, Mr. Charles Hawkins, under whose auspices we may shortly expect a complete, revised, and enlarged edition of the whole of Sir B. Brodie's works; and the subject upon which Sir Benjamin dwelt, with peculiar interest in that, perhaps his last conversation, was the success of the Medical School of St. George's Hospital.*

He lives! His spirit lives among us; not only as

* Through the kindness of Mr. Charles Hawkins I am enabled to give the following extract from the as yet unpublished autobiography of the late Sir Benjamin Brodie:—

"In March, 1808, I was elected Assistant-Surgeon to St.

represented by those who were the early companions of his labours, his first pupils, and his attached friends, but by his son.

The present Sir Benjamin Brodie has continued for our benefit the Annual Prize, instituted by his father for the advancement of Clinical Surgery—a prize given in order to "illustrate by example," as I conceive, the principles which the late Sir B. Brodie had so long taught from this place—and he has very recently given to this hospital, a series of beautiful drawings, a faithful record of those early labours upon which his father's reputation was destined to be founded; and has thus shown his wish to perpetuate, as much as in him lay, not the

George's Hospital. In January, 1840, after having filled the place of Assistant-Surgeon for 14 years, and that of Surgeon for nearly 18 years, I resigned my office. During these 32 years the hospital, as far as my profession was concerned, was the greatest object of interest that I possessed. Except during the brief intervals of my absence from London, it rarely happened that I was not, some time during the day, within its walls. I was indebted to the opportunities which it afforded me for the best part of the knowledge which I had been able to attain. It had rendered my professional life one of agreeable study, instead of mechanical and irksome drudgery. Some of my happiest hours were those during which I was occupied in the wards, with my pupils around me, answering the inquiries, explaining the cases to them at the bedside of the patients, informing them as to the grounds on which I formed my diagnosis, and my reasons for the treatment which I employed, and not concealing from them my oversights and errors—and all this to kind and willing and only too partial listeners. My intercourse with the students, and I may add with the patients also, was always to me a real source of gratification; and even now (many years afterwards) these scenes are often renewed to me at night, and events, of which I

name only, but the present living influences of our departed friend.

The abilities, the industry, the influence of Brodie, were employed without interruption to the last hour of his prolonged life, to extend the benefits, as well as to increase the knowledge of our common profession. These were his ends, and for their attainment at that time, when a love of ease creeps over most minds, he

"Scorn'd delights, and liv'd laborious days."

Let his successors read his works, not only as printed in books, but as recorded in our museum—

have no recollection when awake, come before me in my dreams. It was not without a painful effort that I made up my mind to resign an office to which I had been sincerely attached. In doing so I was influenced by various considerations. One of them was that I began to feel the necessity of diminishing the amount of my labours. Then I had long since formed the resolution that I would never have it said of myself, as I have heard it said of others, that I retained a situation of such importance and responsibility, when, either from age or from indifference, I had ceased to be fully equal to the duties belonging to it; and lastly, when I saw intelligent and diligent and otherwise deserving young men around me, waiting their turn to succeed to the hospital appointments, it seemed to me that there was something selfish in standing longer in their way, when, as far as my own mere worldly interests were concerned, I had obtained all that I could desire. I have found no reason to be dissatisfied with the resolution which I had formed and the step which I took in consequence; yet, for some considerable time after I had taken it, I had many uncomfortable feelings, and I never passed by the hospital without something like a painful recollection that my labours there were at an end."

a museum founded on Sir B. Brodie's private collection—and consider that they were not undertaken merely to gain fame for himself, but to give solid instruction to others. Let them reflect that their progress in knowledge will make it either their glory or their shame that they have studied in the school of Hunter and of Brodie.

If we then value the name of one who has done so much for the interests of our common profession let us hear him speak to us once again in his own truthful, unadorned, but powerful language.

"You are entering," I once heard him say, and I noted his words, "upon a profession which is good or bad according to the manner in which it is pursued. Let me offer you some suggestions as to your conduct in it. On no occasion allow anything to interfere with the strict performance of your professional duties. Whatever you undertake to do, that do to the very best of your ability, sparing neither thought nor trouble, whether it be in the case of the poor man, to whom you give gratuitous assistance, or of the rich man, who remunerates you liberally for your attentions.

"Consider yourselves as being engaged, not in a trade, but in the cultivation of a noble and interesting science. Let it be your first object to deserve and obtain the good opinion of all classes of society with whom you come in contact, not only as being skilful practitioners, but as men of honour and integrity. You will thus be in that independent situation which will place you above the caprice of the foolish, and also

above the necessity of stooping to obtain the favour of any individual.

"Do justice to others, but do justice also to your profession and to yourselves; always bearing in mind that those who are in any way usefully and worthily employed have a much higher place in the scale of existence than those useless and selfish persons who live only for themselves, however high their rank, however large their fortune."

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